

IFW

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Dated: March 11, 2005

Signature:

Judy Bridgewater
(Judy Bridgewater)

Docket No.: 532232001200
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Jeffrey P. WHITTEN et al.

Application No.: 10/820,487

Filed: April 7, 2004

For: HETEROCYCLIC SUBSTITUTED 1,4-
DIHYDRO-4-OXO-1,8-NAPHTHPYRIDINE
ANALOGS

Confirmation No.: 7396

Art Unit: 1645

Examiner: Not Yet Assigned

REQUEST FOR CORRECTED FILING RECEIPT

Filing Receipt Corrections
Office of Initial Patent Examination
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant hereby requests that a corrected Filing Receipt be issued in the above-identified patent application. The corrections needed are as follows:

Please correct the name of the third applicant from:

"Terrance Moran"

to: **--Terence Moran--**

Also please correct the Title from:

**"HETEROCYCLIC SUBSTITUTED 1,4-DIHYDRI-4OXO-1,8 NAPHTHYRIDINE
ANGALOGS"**

sd-248913

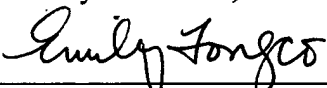
to: --HETEROCYCLIC SUBSTITUTED 1,4-DIHYDRO-4-OXO-1,8-
NAPHTHPYRIDINE ANALOGS--

The following documents are enclosed herewith: Exhibit A: copy of the marked-up Filing Receipt; Exhibit B: copy of the Supplemental Declaration as filed on January 25, 2005 showing the correct spelling of the third applicant's name; Exhibit C: copy of the first page of Application as originally filed; and a Supplemental Application Data Sheet.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 532232001200. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: March 11, 2005

Respectfully submitted,

By 
Emily C. Tongco

Registration No.: 46,473
MORRISON & FOERSTER LLP
3811 Valley Centre Drive
Suite 500
San Diego, California 92130-2332
(858) 314-5413

FEB 23 2005



UNITED STATES PATENT AND TRADEMARK OFFICE

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| APPL NO. | FILING OR 371 (c) DATE | ART UNIT | FIL FEE REC'D | ATTY. DOCKET NO | DRAWINGS | TOT CLMS | IND CLMS |
|------------|---------------------------|----------|---------------|-----------------|----------|----------|----------|
| 10/820,487 | 04/07/2004 | 1645 | 648 | 532232001200 | | 42 | 2 |

25225
 MORRISON & FOERSTER LLP
 3811 VALLEY CENTRE DRIVE
 SUITE 500
 SAN DIEGO, CA 92130-2332

DOCKETED: Correct DFR
 REMINDER: 39-05
 FINAL DUE DATE: _____

CONFIRMATION NO. 7396
 CORRECTED FILING RECEIPT
 OC000000015144536
 OC000000015144536

Date Mailed: 02/09/2005

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Filing Receipt Corrections, facsimile number 703-746-9195. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

Applicant(s)

Jeffrey P. Whitten, Santee, CA;
 Michael Schwabe, San Diego, CA;
 Terrance Moran, San Diego, CA;

Terrance

Power of Attorney: The patent practitioners associated with Customer Number 25225.

Domestic Priority data as claimed by applicant

This appln claims benefit of 60/461,205 04/07/2003
 and claims benefit of 60/519,569 11/12/2003

Foreign Applications

If Required, Foreign Filing License Granted: 06/23/2004

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US10/820,487**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

EXHIBIT A

PCW

**** SMALL ENTITY ****

Title

DIHYDRO-4-OXO-1,8-NAPHTHPYRIDINE ANALOGS
~~HETEROCYCLIC SUBSTITUTED 1,4-DIHYDRO-4-OXO-1,8-NAPHTHYRIDINE ANALOGS~~

Preliminary Class

435

**LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15**

GRANTED

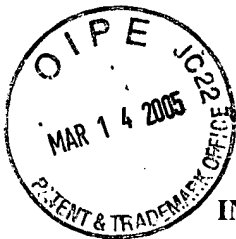
The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Office of Export Administration, Department of Commerce (15 CFR 370.10 (j)); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

DECLARATION FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

HETEROCYCLIC SUBSTITUTED 1,4-DIHYDRO-4-OXO-1,8-NAPHTHTHYRIDINE
ANALOGS

the specification of which was filed on April 7, 2004 as Application No. 10/820,487.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by an amendment, if any, specifically referred to herein.

I acknowledge the duty to disclose all information known to me that is material to patentability in accordance with Title 37, Code of Federal Regulations, § 1.56.

FOREIGN PRIORITY CLAIM

I hereby claim foreign priority benefits under Title 35, United States Code § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

☒ no foreign applications have been filed

☐ foreign application have been filed as follows:

EARLIEST FOREIGN APPLICATION(S), IF ANY FILED WITHIN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION

| Application Number | Country | Date of Filing | Priority Claimed Under 35 USC 119 |
|--------------------|---------|----------------|--------------------------------------|
| | | | ___ Yes No ___ |
| | | | ___ Yes No ___ |
| | | | ___ Yes No ___ |

ALL FOREIGN APPLICATION(S), IF ANY FILED MORE THAN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION

| Application Number | Country | Date of Filing |
|--------------------|---------|----------------|
| | | |
| | | |
| | | |

CLAIM FOR BENEFIT OF EARLIER U.S. PROVISIONAL APPLICATIONS

I hereby claim priority benefits under Title 35, United States Code §119(e), of any United States provisional patent application(s) listed below:

☐ no U.S. provisional applications have been filed.

☒ U.S. provisional application have been filed as follows:

| Application Number | Date of Filing | Priority Claimed Under 35 USC 119 |
|--------------------|-------------------|--------------------------------------|
| 60/461,205 | April 7, 2003 | <u> x </u> Yes No ___ |
| 60/519,569 | November 12, 2003 | <u> x </u> Yes No ___ |
| | | ___ Yes No ___ |

CLAIM FOR BENEFIT OF EARLIER U.S./PCT APPLICATION(S)

I hereby claim the benefit under Title 35, United States Code, §120 of the United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose all information that is material to patentability in accordance with Title 37, Code of Federal Regulations, §1.56 which became available to me between the filing date of the prior application and the national or PCT international filing date of this application:

☒ no U.S./PCT applications have been filed.

☐ U.S./PCT application have been filed as follows:

| Application Number | Date of Filing | Status (Patented/Pending/Abandoned) |
|--------------------|----------------|--|
| | | |
| | | |
| | | |

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint:

All practitioners at Customer Number 25225

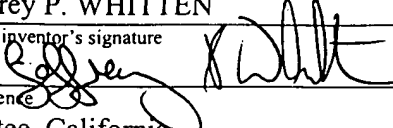
all of **Morrison & Foerster LLP**, 3811 Valley Centre Drive, Suite 500, San Diego, California 92130, jointly, and each of them severally, my attorneys at law/patent agent(s), with full power of substitution, delegation and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the U. S. Patent and Trademark Office connected therewith.

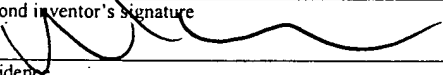
Please mail all correspondence to Kate H. Murashige, whose address is:

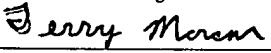
Morrison & Foerster LLP
3811 Valley Centre Drive, Suite 500
San Diego, California 92130

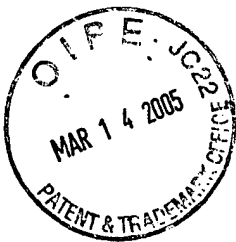
Please direct telephone calls to: Emily C. Tongco at (858) 314-5413.

Please direct facsimiles to: (858) 720-5125

| | |
|---|---------------------------|
| Full name of third inventor, if any Jeffrey P. WHITTEN | |
| Third inventor's signature  | Date 10-25-2004 |
| Residence Santee, California | |
| Citizenship US | |
| Mailing Address 9957 Jill Street Santee, California 92071 | |

| | |
|--|-------------------------|
| Full name of second inventor, if any Michael SCHWAEBE | |
| Second inventor's signature  | Date 10/25/04 |
| Residence San Diego, California | |
| Citizenship US | |
| Mailing Address 13933 Kerry Lane San Diego, California 92130 | |

| | |
|---|---------------------------|
| Full name of sole or first inventor Terence MORAN | |
| Sole or first inventor's signature  | Date 10-21-2004 |
| Residence San Diego, California | |
| Citizenship US | |
| Mailing Address 11947 Dapple Way San Diego, California 92128 | |



HETEROCYCLIC SUBSTITUTED 1,4-DIHYDRO-4-OXO-1,8-NAPHTHPYRIDINE ANALOGS

Cross-Reference to Related Applications

[0001] This application claims benefit of U.S. provisional application 60/461,205, filed April 7, 2003, and 60/519,569, filed November 12, 2003. The contents of these documents are incorporated herein by reference.

Field of the Invention

[0002] The invention relates to substituted 1,4-dihydro-4-oxo-1,8-naphthpyridine analogs, and treatment methods using such compounds.

Background

[0003] Quadruplexes can form in certain purine-rich strands of nucleic acids. In duplex nucleic acids, certain purine rich strands are capable of engaging in a slow equilibrium between a typical duplex helix structure and in unwound and non-B-form regions. These unwound and non-B forms can be referred to as "paranemic structures." Some forms are associated with sensitivity to S1 nuclease digestion, which can be referred to as "nuclease hypersensitivity elements" or "NHEs." A quadruplex is one type of paranemic structure and certain NHEs can adopt a quadruplex structure. Considerable circumstantial evidence suggests that quadruplex structures can exist in vivo in specific regions of the genome, including the telomeric ends of chromosomes and oncogene regulatory regions. (Han, *et al.*, *Trends Pharm. Sci.* (2000) 21:136-142). Thus, quadruplex forming regions of DNA may be used as molecular targets for anticancer agents.

Summary of the Invention

[0004] Compounds described herein interact with regions of DNA that can form quadruplexes and act as tumor suppression genes with high affinity. Such compounds can reduce expression of highly proliferate genes and are utilized for treating cancers. Furthermore, the compounds may also exhibit antibacterial or antiviral activity, and may be used for treating bacterial and viral infections.

Supplemental Application Data Sheet

Application Information

| | |
|----------------------------------|--|
| Application number:: | <u>10/820,487</u> |
| Filing Date:: | <u>04/07/04</u> |
| Application Type:: | Regular |
| Subject Matter:: | Utility |
| Suggested Group Art Unit:: | 1645 |
| CD-ROM or CD-R?:: | None |
| Sequence submission?:: | None |
| Computer Readable Form (CRF)?:: | No |
| Title:: | HETEROCYCLIC SUBSTITUTED 1,4- DIHYDRO-4-OXO-1,8-NAPHTHTHYRIDINE <u>-NAPHTHPYRIDINE ANALOGS</u> |
| Attorney Docket Number:: | 532232001200 |
| Request for Early Publication?:: | No |
| Request for Non-Publication?:: | No |
| Small Entity?:: | Yes |
| Petition included?:: | No |
| Secrecy Order in Parent Appl.?:: | No |

Applicant Information

| | |
|----------------------------------|------------------|
| Applicant Authority Type:: | Inventor |
| Primary Citizenship Country:: | US |
| Status:: | Full Capacity |
| Given Name:: | Jeffrey |
| Middle Name:: | P. |
| Family Name:: | WHITTEN |
| City of Residence:: | Santee |
| State or Province of Residence:: | CA |
| Country of Residence:: | US |
| Street of mailing address:: | 9957 Jill Street |

City of mailing address:: Santee
State or Province of mailing address:: CA
Postal or Zip Code of mailing address:: 92071

Applicant Authority Type:: Inventor
Primary Citizenship Country:: US
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Given Name:: Michael
Family Name:: SCHWAEBE
City of Residence:: San Diego
State or Province of Residence:: CA
Country of Residence:: US
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City of mailing address:: San Diego
State or Province of mailing address:: CA
Postal or Zip Code of mailing address:: 92130

Applicant Authority Type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: ~~Terrance~~ Terence
Family Name:: MORAN
City of Residence:: San Diego
State or Province of Residence:: CA
Country of Residence:: US
Street of mailing address:: 11947 Dapple Way
City of mailing address:: San Diego
State or Province of mailing address:: CA
Postal or Zip Code of mailing address:: 92128

Correspondence Information

Correspondence Customer Number:: 25225

Representative Information

Representative Customer Number:: 25225

Domestic Priority Information

| Application:: | Continuity Type:: | Parent Application:: | Parent Filing Date:: |
|------------------|---|----------------------|----------------------|
| This Application | An application claiming the benefit under 35 USC 119(e) | 60/461,205 | 4/7/03 |
| This Application | An application claiming the benefit under 35 USC 119(e) | 60/519,569 | 11/12/03 |



PTO/SB/21 (09-04)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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| | | | |
|---|----|------------------------|--------------------|
| TRANSMITTAL FORM (to be used for all correspondence after initial filing) | | Application Number | 10/820,487 |
| | | Filing Date | April 7, 2004 |
| | | First Named Inventor | Jeffrey P. WHITTEN |
| | | Art Unit | 1645 |
| | | Examiner Name | Not Yet Assigned |
| Total Number of Pages in This Submission | 13 | Attorney Docket Number | 532232001200 |

| ENCLOSURES (Check all that apply) | | |
|---|--|---|
| <input type="checkbox"/> Fee Transmittal Form | <input type="checkbox"/> Drawing(s) | <input type="checkbox"/> After Allowance Communication to TC |
| <input type="checkbox"/> Fee Attached | <input type="checkbox"/> Licensing-related Papers | <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences |
| <input type="checkbox"/> Amendment/Reply | <input type="checkbox"/> Petition | <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) |
| <input type="checkbox"/> After Final | <input type="checkbox"/> Petition to Convert to a Provisional Application | <input type="checkbox"/> Proprietary Information |
| <input type="checkbox"/> Affidavits/declaration(s) | <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address | <input type="checkbox"/> Status Letter |
| <input type="checkbox"/> Extension of Time Request | <input type="checkbox"/> Terminal Disclaimer | <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): |
| <input type="checkbox"/> Express Abandonment Request | <input type="checkbox"/> Request for Refund | Request for Corrected Filing Receipt (2 pages) |
| <input type="checkbox"/> Information Disclosure Statement | <input type="checkbox"/> CD, Number of CD(s) _____ | Exhibit A: Marked-up copy of Corrected Filing Receipt (2 pages) |
| <input type="checkbox"/> Certified Copy of Priority Document(s) | <div style="border: 1px solid black; height: 80px; width: 100px; margin: 0 auto;"></div> Landscape Table on CD | Exhibit B: Copy of Supplemental Declaration filed January 25, 2005 (4 pages) |
| <input type="checkbox"/> Reply to Missing Parts/Incomplete Application | Remarks | Exhibit C: Copy of first page of Application as originally filed (1 page) |
| <input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53 | Customer No. 25225 | Supplemental Application Data Sheet (3 pages) |
| | | Return Receipt Postcard |

| SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT | | | |
|--|-------------------------|----------|--------|
| Firm Name | MORRISON & FOERSTER LLP | | |
| Signature | | | |
| Printed name | Emily C. Tongco | | |
| Date | March 11, 2005 | Reg. No. | 46,473 |

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Dated: March 11, 2005

Signature: (Judy Bridgewater)